

## A New Species of *Carex* (Cyperaceae), *C. bitchuensis*, from Okayama Prefecture, Japan

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(Received on September 5, 2002)

A new species, *Carex bitchuensis* T.Hoshino & H.Ikeda (Cyperaceae), is described. This species is similar to *C. lanceolata* Boott and *C. pediformis* C.A.Mey. in having obovoid to fusiform hairy perigynia with a recurved short beak, but differs in having short creeping-ascending rhizomes, wide leaves, short pistillate scales, and short perigynia. Chromosome number of *C. bitchuensis* is  $2n = 36$  (diploid) while *C. lanceolata*  $2n=72$  and *C. pediformis*  $2n=70$  (tetraploid levels). *Carex bitchuensis* occurs on exposed limestone in the northwestern part of Okayama Prefecture, southwestern Japan.

**Key words:** Atetsu Region, *Carex*, Cyperaceae, limestone plant, new species.

***Carex bitchuensis*** T.Hoshino & H.Ikeda,  
sp. nov. [Fig. 1]

*Carici lanceolatae* Boott et *C. pediformis* C.A.Mey. proxime affinis, sed rhizomatibus brevi adscendenti-repentibus, foliis latoribus, squamis foemineae brevioribus et perigynis curtioribus bene differt. Numero chromosomatum  $2n=36$ .

Type: Okayama Pref.; Kawakami-gun, Nariwa-cho, Kinomura, “Fufu-iwa”, 410 m alt. (T. Hoshino, H. Ikeda & K. Furuta 99051201, 12 May 1999, OKAY-holo; KYO, TI, TNS-iso).

Perennial herb. Rhizomes short-creeping, ascending, covered with gray-brown somewhat fibrous remains of leaf-sheaths. Leaf-blade linear, nearly flat, 7–12 cm long when anthesis, elongating after anthesis, 2.5–3 mm wide, margins slightly scabrous; basal sheaths ferrugineous to castaneous, splitting into parallel fibres. Culms 12–23 cm tall, almost same as tall as or slightly taller than basal leaves, slightly scabrous on upper portion. Spikes 3 or 4, erect; terminal spike

staminate, linear-clavate, 15–20 mm long, 1.5–3 (–3.5) mm wide, taller than lower spikes; staminate scales narrowly elliptic to broadly oblanceolate, 6–7 mm long, 1.4–2.2 mm wide, apex acute or short-awned, centre pale castaneous to ferrugineous, margins hyaline and whitish; lateral spikes pistillate, linear, 5–15 mm long, loosely 2–5-flowered; pistillate scales ovate to broadly ovate, 3–3.5 mm long, 2–2.5 mm wide, apex acuminate or awned, centre pale castaneous to ferrugineous, margins hyaline and whitish; bract at base of pistillate spike spathaceous, bladeless, 5–18 mm long, apex short-awned, pale castaneous to ferrugineous except hyaline whitish margins; prophyll spathaceous, surrounding pistillate spike, hyaline, glabrous; peduncles slightly exerted from bract, pubescent. Stamens 3; filament filiform, 3.5–4 mm long; anther linear, ca. 3 mm long, 0.2–0.4 mm wide. Ovary 1, enclosed in a perigynium, narrowly obovate, 1–1.2 mm long, 0.5–0.7 mm wide, indistinctly trigonous, 1-ovulate; ovule



Fig. 1. *Carex bitchuensis* T.Hoshino & H.Ikeda. A: Habit. B: Staminate and pistillate spikes. C: Pistillate scale. D: Staminate scale. E: Perigynium, dorsal view. F: Perigynium, side view. G: Achene, side view. H: Achene, dorsal view. Bars = 1 cm for B; 1 mm for C–H. Drawn from the holotype.

orthotropous; style 1, 3-fid, filiform, plumose, 4–5 mm long, deciduous at fruiting. Perigynium obovoid, with a thick oblique stipe, 2.4–2.6 mm long, 0.8–1.2 mm wide, indistinctly trigonous, obsoletely thick-nerved, densely short-pubescent; beak very short, 0.1–0.2 mm long, abruptly recurved, ferrugineous, apex entire. Achene enclosed in a perigynium, trigonous, 2.2–2.4 mm long, 0.7–1.1 mm wide, glabrous.

Chromosome number:  $2n = 36$ .

Japanese name: Bitchû-hikage-suge (nov.).

Distribution: Endemic to Japan; limestone areas in the northwestern part of Okayama Prefecture.

Specimens examined: Japan. Okayama Prefecture; Kawakami-gun, Bitchû-cho, Zentsubashi (T. Hoshino 6772–6778, 12 May 1993, OKAY); Nariwa-cho, Keisoku-dani (H. Ikeda & K. Furuta 14485–14490, 12 May 1999, OKAY); Nariwa-cho, Kinomura, Fufu-iwa, 350 m (T. Hoshino & al. 13548–13552, 13554–13556, 11 Apr. 1998, OKAY); *ibid.* (T. Masaki 15366, 15367, 26 May 1999, OKAY).

During the course of revising Japanese *Carex*, we found this undescribed *Carex* in Kawakami-gun, Okayama Prefecture, southwestern Japan. This, *C. bitchuensis* T.Hoshino & H.Ikeda, is similar to *C. lanceolata* Boott and *C. pediformis* C.A.Mey. in having obovoid to fusiform hairy perigynia with a recurved short beak,

but differs in having short-creeping ascending rhizomes (densely tufted in *C. lanceolata* and *C. pediformis*), wide leaves (2.5–3 mm wide in *C. bitchuensis* while 1–2 mm wide in *C. lanceolata* and 1.5–2.5 mm wide in *C. pediformis*), short pistillate scales (3–3.5 mm long in *C. bitchuensis* while 4–6 mm long in *C. lanceolata* and 4–5 mm long in *C. pediformis*), and short perigynia (2.4–2.6 mm long in *C. bitchuensis* while 2.7–3.1 mm long in *C. lanceolata* and ca. 3 mm long in *C. pediformis*). Moreover, *C. bitchuensis* differs from *C. pediformis* in having only slightly scabrous culms and smooth leaves—those of *C. pediformis* being densely papillate (Table 1).

*Carex lanceolata* was described from the specimens collected in Hakodate, Hokkaido (Boott 1856), and is distributed in Japan (Hokkaido to Kyushu), Korea, China, and Ussuri (Ohwi 1984). Although we collected *C. lanceolata* near the type locality of *C. bitchuensis*, *C. lanceolata* was found on soil at the edge of deciduous forests. We have not found any intermediate individuals between *C. bitchuensis* and *C. lanceolata* in the fields and also in herbarium specimens. *Carex pediformis* is distributed in Kamchatka, E Siberia, NE China, and Korea (Akiyama 1955), and not distributed in

Table 1. Comparison of morphological characters and chromosome numbers of *Carex bitchuensis*, *C. lanceolata*, and *C. pediformis*

	<i>C. bitchuensis</i>	<i>C. lanceolata</i>	<i>C. pediformis</i>
Rhizomes	short-creeping, ascending	very short, densely tufted	short-creeping, densely tufted
Culms	smooth in lower, slightly scabrous in upper portion	smooth in lower, slightly scabrous in upper portion	strongly scabrous
Leaves	2.5–3 mm wide, smooth	1–2 mm wide, smooth	1.5–2.5 mm wide, densely papillate
Pistillate scales	3–3.5 mm long	4–6 mm long	4–5 mm long
Perigynia	2.4–2.6 mm long	2.7–3.1 mm long	ca. 3.0 mm long
Chromosome numbers	$2n=36$	$2n=72$	$2n=70$

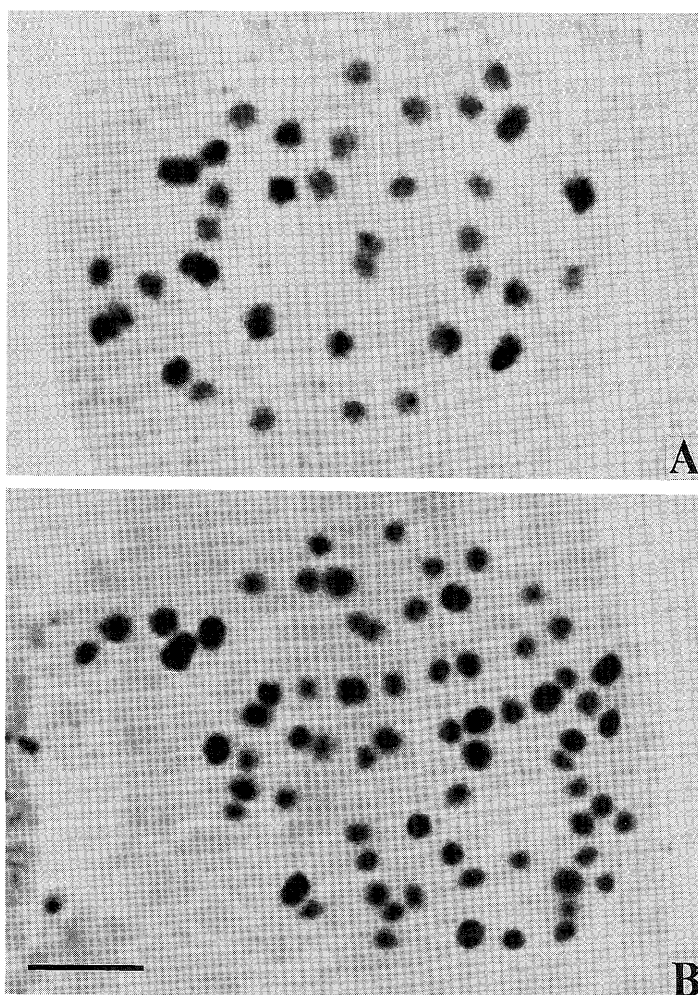


Fig. 2. Mitotic metaphase chromosomes of *Carex bitchuensis* and *C. lanceolata*. A: *C. bitchuensis* ( $2n=36$ ). B: *C. lanceolata* ( $2n=72$ ). Bar = 5  $\mu\text{m}$ .

Japan.

Somatic chromosomes were investigated using root tips. The pretreatment, fixation, maceration, and staining methods for the cytological study followed Hoshino et al. (2000). Chromosome numbers of *C. lanceolata* and *C. pediformis* were reported to be  $2n=72$  (Tanaka 1948) and  $2n=70$  (Davies 1956), respectively. We examined twenty two individuals of *C. bitchuensis* collected in Kawakami-gun, Okayama Prefec-

ture, twenty four individuals of *C. lanceolata* collected in Okayama and Kagawa Prefectures, and eight individuals of *C. pediformis* collected in Myongju-gun, Kang-wong Do, Korea. Fig. 2 shows the somatic chromosomes of *C. bitchuensis* and *C. lanceolata*. We counted  $2n=36$  for *C. bitchuensis*,  $2n=72$  for *C. lanceolata*, and  $2n=\text{ca. } 70$  for *C. pediformis*. These counts have clarified that *C. bitchuensis* has a different ploidy level from other species, diploid in *C. bitchuensis*

and tetraploid in *C. lanceolata* and *C. pediformis*.

*Carex bitchuensis* grows on exposed limestone with *Carpinus turczaninovii* Hance, *Abelia integrifolia* Koidz., *Buxus microphylla* Siebold & Zucc. var. *insularis* Nakai, *Rhamnus yoshinoi* Makino, and *Spiraea nervosa* Franch. & Sav., near the Takahashi River. Maekawa (1974) recognized this area as a distinct floristic area, and named it Atetsu Region. The Atetsu Region is characterized by narrow endemic species or species related to those in Korea and China, such as *Carpinus turczaninovii*, *Chloranthus fortunei* (A.Gray) Solms-Laub., *Abelia integrifolia*, and *Youngia yoshinoi* (Makino) Kitam. (Maekawa 1974). From the distribution and habitat, *C. bitchuensis* is thought to be a limestone plant and one of the elements of the Atetsu Region.

We express our thanks to Professor Hideaki Ohba, University of Tokyo, for his

critical reading and correcting the Latin description and to Mr. Kiyotaka Yasuhara, for providing materials of *C. bitchuensis*. We also thank to Mrs. Mariko Nishimoto for her fine drawing of *C. bitchuensis*.

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星野卓二, 池田 博: 岡山県産カヤツリグサ科スゲ属の1新種, ビッチュウヒカゲスゲ

ビッチュウヒカゲスゲ (*Carex bitchuensis* T.Hoshino & H.Ikeda) は, ヒカゲスゲ (*C. lanceolata* Boott) とタカヒカゲスゲ (*C. pediformis* C.A.Meyer) に類似するスゲ属の1新種である。それは, 横走り斜上する根茎 (ヒカゲスゲの根茎は短く密に叢生し, タカヒカゲスゲの根茎は短く斜上するものの密に叢生する), 幅広い葉 (ビッチュウヒカゲスゲでは幅2.5–3 mm, ヒカゲスゲでは幅1–2 mm, タカヒカゲスゲでは幅1.5–2.5 mm), 小型の雌鱗片 (ビッチュウヒカゲスゲでは長さ3–3.5 mm, ヒカゲスゲでは長さ4–6 mm, タカヒカゲスゲでは長さ4–5 mm) と小型の果包 (ビッチュウヒカゲスゲでは長さ2.4–2.6 mm, ヒカゲスゲでは長さ2.7–

3.1 mm, タカヒカゲスゲでは長さ約3 mm) を持つことにより区別される。また, タカヒカゲスゲとは, 桿はわずかにざらつく (タカヒカゲスゲは著しくざらつく) こと, 葉に乳頭状突起を持たない (タカヒカゲスゲは葉の背面に乳頭状突起を密布することなどでも区別される。ビッチュウヒカゲスゲの染色体数は  $2n=36$  であり,  $2n=72$  のヒカゲスゲや,  $2n=70$  のタカヒカゲスゲとは異なる。

ビッチュウヒカゲスゲは岡山県北西部の石灰岩地域に特産する。

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